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10/688,392

10/17/2003

Uri Elzur

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500 WEST MADISON STREET
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CHICAGO, IL 60661

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BELL, LOUIS W

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/688,392

Applicant(s)

ELZUR, URI

Examiner

Louis Bell

Art Unit

2619

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 18-40 is/are rejected.
- 7) ☒ Claim(s) 17 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

1. This is a Non-Final Office Action in response to the present US Application filed on 10/17/2003. **Claims 1-40** are presented for examination. No Claims are withdrawn.

Claims Objection

2. **Claim 17 and 18** objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1, 2, 6, 7 and 8** are rejected under 35 U.S.C. 102 b as being anticipated by Patent No.: US 5,958,017 to Scott et al., "Scott".

As to **Claim 1** Scott discloses communications system (*fig. 2 discloses a communication system and a node with 4 sets of input/output buffers, col.2 lines 45-55*), comprising: a first queue pair (QP) associated with a first connection, the first QP comprising a first send queue (SQ) (*virtual channel 1 has a assigned dedicated send*

buffer 260.0 and 260.1, col. 8 lines 30-35, fig. 5a and virtual channel 1 has a received buffer 280.4-280.5, col. 9 lines 8-25, fig. 6A); a second QP associated with a second connection, the second QP comprising a second SQ (virtual channel 2 has a dedicated send buffer 260.2 through 260.6 col. 8 lines 30-35, fig. 5a and virtual channel 2 has a received buffer 280.4-280.5, col. 9 lines 8-25, fig. 6A); and a general pool comprising a shared receive queue (SRQ), the SRQ being shared by the first QP and the second QP (fig. 4 and fig. 6a disclose a large received buffer pool shared by virtual channel 1 and 2 and thus the queue pairs, col.7 lines 50-67 and col. Lines 8-25).

As to **Claim 2** Scott discloses the communications system according to claim 1;

Scott further discloses the first QP and the second QP are part of a particular node (fig. 4, fig 5.a and fig. 6a show the QP as part of the same node, col.7 lines 50-67, col. 8 lines 29-36 and col. Lines 8-25).

As to **Claim 6** Scott discloses the communications system according to claim 1; wherein the SRQ comprises a plurality of posted buffers (*the large receive buffer has a plurality of buffers 280.0-280.5 shared among the virtual channels and assigned to them, i.e. buffers 280.4 and 280.5 are assigned to virtual channels 1 and 2, fig. 6A col. 9 lines 8-25*).

As to **Claim 7** Scott discloses the communications system according to claim 1; wherein the first QP does not have its own dedicated received queue (RQ). (*Neither virtual channel 1 nor 2 have dedicated receive buffers, they share buffers 280.4 and 280.5 fig. 6A col. 9 lines 8-25*).

As to **claim 8** Scott disclose the communications system according to claim 1;

Scot further discloses the first QP conducts communications over the first connection as if the first QP has access to more resources of the SRQ than a statistical determination of resource requirements of the first connection (virtual channel 2 communicates using SQ 206.2-206.6, col. 8 lines 30-35, and uses and share receive queue 280.4-208.5 where the queue reservation protocol guarantee that all packets transmitted will eventually be accepted, col. 9 lines 8-25).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claim 3 and 34** are rejected under 35 U.S.C. 103(a) as being unpatentable over Patent No.: US 5,958,017 to Scott et al., "Scott" in view of Patent No.: US 5,889,956 to Hauser et al., "*Hauser*".

As to **claim 3** Scott discloses the communications system according to claim 1;

Scott does not expressly disclose the SRQ comprises an amount of resources that is statistically determined;

Hauser discloses provisioning network resources such as bandwidth and buffers based on statistically calculated demands (col. 1 lines 1-25);

Scott and Hauser are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott and Hauser with motivations such as to allow resources to be used and assigned more effectively (*Hauser, col. 3 lines 5-8*).

As to **claim 34** Scott discloses a method for communicating, comprising:
establishing a first connection associated with a first queue pair (QP); establishing a second connection associated with a second QP; concurrently sharing a single receive queue (RQ) between the first QP and the second QP (*virtual channel 1 is associated with send buffer 260.1 and virtual channel 2 is associated with send buffer 260.6, col. 8 lines 30-35, also virtual channel 1 and 2 are associated with receive buffer 280.4, col. 9 lines 8-25*);

Scott does not expressly disclose provisioning the single RQ using statistical information;

Hauser discloses provisioning network resources such as bandwidth and buffers based on statistically calculated demands (*col. 1 lines 1-25*);

Scott and Hauser are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott and Hauser with motivations such as to allow resources to be used and assigned more effectively (*Hauser, col. 3 lines 5-8*).

7. **Claim 4 and 5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Patent No.: US 5,958,017 to Scott et al., "Scott" in view of Patent No.: US 5,889,956 to Hauser *et al.*, "*Hauser*" as applied to claim 3 above, and further in view of patent No.: US 5,999,518 to Nattkemper et al. "Nattkemper".

As to **claim 4** Scott and Hauser disclose the communications system according to claim 3,

Scott and Hauser do not expressly disclose the amount of resources is statistically determined based upon empirical resource requirements of the first connection and the second connection;

Nattkemper discloses buffer being statically provisioned (col. 22 lines 25-34);

Scott, Hauser and Nattkemper are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott, Hauser and Nattkemper with motivations such as to establishing and updating address information storage (Nattkemper, col. 1 line 40-41).

As to **claim 5** Scott and Hauser disclose the communications system according to claim 3,

Scott and Hauser do not expressly disclose the amount of resources is statistically determined based upon dynamic statistics;

Nattkemper discloses buffer being dynamic provisioned (col. 22 lines 25-34);

Scott, Hauser and Nattkemper are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott, Hauser and Nattkemper with motivations such as to establishing and updating address information storage (*Nattkemper, col. 1 lines 40-41*).

8. **Claim 9, 10, 11, 12, 13 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Patent No.: US 5,958,017 to Scott et al., "Scott" in view of Patent No.: 5,867,663 to McClure et al., "McClure".

As to **claim 9** Scott disclose the communications system according to claim 1;

Scott does not expressly discloses the first QP comprises a first limit queue (LQ) that limits an amount of resources of the SRQ that the first QP can access, and wherein the second QP comprises a second limit queue (LQ) that limits an amount of resources of the SRQ that the second QP can access;

McClure discloses allocating buffer space to a queue where the buffer space is implemented by assigning a counter limit which represents the number of cell locations in a buffer pool that may be used by a particular queue at any one time during the connection (*col. 5 lines 28-46*);

Scott and McClure are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scoot and McClure with motivations such as to improve the system resources of a network (*McClure, col. 2 lines 5-8*).

As to **claim 10** Scott and McClure disclose the communications system according to claim 9;

Scott does not expressly disclose if the first QP exceeds a limit as set forth in the first LQ, then the first connection is dropped;

McClure disclose allocating network recourses and dedicating them to a virtual communication to guaranty a quality of service, it is obvious that is the queue capacity is exceeded the packets will be drop and this will case the quality of service to be degraded and thus lead to dropping the connection (*col.5 lines 30-50*);

Scoot and McClure are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scoot and McClure with motivations such as to improve the system resources of a network (*McClure, col. 2 lines 5-8*).

As to **claim 11** Scott and McClure disclose the communications system according to claim 9;

Scott does not expressly disclose the first LQ and the second LQ are managed locally;

McClure discloses that the counter limit to the queue is allocated by the communication device (*col. 5 lines 26-42*);

Scot and McClure are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scot and McClure with motivations such as to improve the system resources of a network (*McClure, col. 2 lines 5-8*).

As to **claim 12** Scot and McClure disclose the communications system according to claim 11;

Scot does not expressly disclose the first LQ and the second LQ are managed locally without communications with other nodes.

McClure discloses that the counter limit to the queue is allocated by each communication device (*col. 5 lines 26-42*);

Scot and McClure are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scot and McClure with motivations such as to improve the system resources of a network (*McClure, col. 2 lines 5-8*).

As to **claim 13** Scot and McClure disclose the communications system according to claim 9;

Scot does not expressly disclose at least one of the first LQ and the second LQ is a soft limit.

McClure discloses that the size of a shared buffer can be adjusted dynamically (*col. 7 lines 17-24*);

Scot and McClure are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scot and McClure with motivations such as to improve the system resources of a network (*McClure*, col. 2 lines 5-8).

As to **claim 14** Scot and McClure disclose the communications system according to claim 13;

Scot does not expressly disclose if the soft limit is reached, then a connection behavior of the first connection or the second connection is analyzed before a response is generated, and wherein the generated response is based on the analyzed connection behavior.

McClure discloses a buffer pool with one or more thresholds above which certain connections with a traffic type is denied (*col. 9 lines 35-41*);

Scot and McClure are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scot and McClure with motivations such as to improve the system resources of a network (*McClure*, col. 2 lines 5-8).

9. **Claim 15 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Patent No.: US 5,958,017 to Scott et al., "Scott" in view of Patent No.: 5,867,663 to

McClure et al., "McClure" as applied to claim 9 above and further in view of Pub. No.:
US 2003/0115340 A1 to Sagula et al. "Sagula".

As to **claim 15** Scott and McClure disclose the communications system
according to claim 9;

Scott and McClure do not expressly disclose the first LQ and the second LQ is a
hard limit;

Sagula discloses setting up a hard limit in a communication system which is used
to control successful connections (pg. 4 paragraphs 44 and 45);

Scott, McClure and Sagula are analogous art because they are from the same
field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary
skilled in the art to combine the teachings of Scott, McClure and Sagula with
motivations such as dynamically adjust a data transmission system to maintain a high
quality data transmission (Sagula, pg. 1 paragraph 10).

As to **claim 16** Scott and McClure disclose the communications system
according to claim 15;

Scott and McClure do not expressly disclose if the hard limit is reached, then an
automatic response is generated;

Sagula discloses that when the hard limit is exceeded then a process is
terminated (pg. 4 paragraphs 44-45);

Scott, McClure and Sagula are analogous art because they are from the same
field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scoot, McClure and Sagula with motivations such as dynamically adjust a data transmission system to maintain a high quality data transmission (Sagula, pg. 1 paragraph 10).

10. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Patent No.: US 5,958,017 to Scott et al., "Scott" in view of patent No.: US 5,999,518 to Nattkemper et al. "Nattkemper".

As to **claim 19** Scott disclose the communications system according to claim 1, Scoot does not expressly disclose resource allocation for the SRQ is managed locally;

Nattkemper discloses a switching unit where the buffer management is done locally (*col. 22 line 21-59*);

Scott and Nattkemper are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott and Nattkemper with motivations such as to establishing and updating address information storage (*Nattkemper, col. 1 line 40-41*).

11. **Claim 20, 21 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Patent No.: US 5,958,017 to Scott et al., "Scott" in view of Pub. No.: US 2004/0073622 A1 to McDaniel et al., "McDaniel".

As to **claim 20** Scott disclose the communications system according to claim 1;

Scott does not expressly disclose the first QP is associated with a first completion queue (CQ), and wherein the second QP is associated with a second CQ;

McDaniel discloses a completion queue associated with a pool of buffers (pg. 1 paragraph 9);

Scott, and McDaniel are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott and McDaniel with motivations such as to provide a one-shot remote direct memory access (*pg. 2 paragraph 18*).

As to **claim 21** Scott disclose the communications system according to claim 1;

Scott does not expressly disclose the general pool comprises a shared CQ (SCQ), the SCQ being associated with the first QP and the second QP;

McDaniel discloses a completion queue associated with a pool of buffers (pg. 1 paragraph 9);

Scott, and McDaniel are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott and McDaniel with motivations such as to provide a one-shot remote direct memory access (*pg. 2 paragraph 18*).

As to **claim 24** Scott disclose the communications system according to claim 1;

Scott does not expressly disclose the at least one of the first connection and the second connection is an Internet small computer system interface (iSCSI) over RDMA (iSER) connection;

McDaniel discloses transferring data using iSCSI over RDMA (*pg. 3 paragraph 28*);

Scott, and McDaniel are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott, and McDaniel with motivations such as to provide a one-shot remote direct memory access (*pg. 2 paragraph 18*).

12. **Claim 22 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Patent No.: US 5,958,017 to Scott et al., "Scott" in view of Patent No.: US 6,611,883 B1 to Avery *et al.*, "Avery".

As to **claim 22** Scott disclose the communications system according to claim 1;

Scott does not expressly disclose the general pool comprises a memory translation and protection table (TPT) associated with resources of the general pool;

Avery discloses the uses of Queue Pairs and Translation and protection table TPT for an InfiniBand RDMA system (*col. 8 lines 55-64 and fig. 7*)

Scott and Avery are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott and Avery with motivations such as to perform address mapping and translation conventionally perform by an I/O memory management unit (*Avery, col. 3 lines 13-15*)

As to **claim 23** Scott disclose the communications system according to claim 1;

Scott does not expressly disclose at least one of the first connection and the second connection is a remote direct memory access (RDMA) connection;

Avery discloses work queue pairs associated with RDMA processing (*col. 2 lines 40-56 and col. 10 lines 23-31*)

Scott and Avery are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott and Avery with motivations such as to perform address mapping and translation conventionally perform by an I/O memory management unit (*Avery, col. 3 lines 13-15*)

13. **Claim 25, 26, 30 and 33** are rejected under 35 U.S.C. 103(a) as being unpatentable over Pub. No.: US 2004/0073622 A1 to McDaniel et al., "McDaniel" in view of Patent No.: US 5,958,017 to Scott et al., "Scott".

As to **claim 25** McDaniel discloses a communications system, comprising: a network interface card interface (NI) comprising a network interface card (NIC) and a NIC driver, the NIC being coupled to the NIC driver; and a consumer coupled to the NI (*a system has a host which comprises a NIC couple to NIC driver, pg. 2 paragraph 19 and fig. 1*);

McDaniel does not expressly disclose the NIC comprises a first queue pair (QP), a second QP and a shared receive queue (SRQ), and wherein the first QP and the second QP share the SRQ;

Scott discloses a device node with queue pairs and shared received queue where the share received queue is shared by queue pairs (fig. 4, fig 5A and fig. 6A, col. 8 lines 30-35 and col. 9 lines 8-25);

McDaniel and Scott are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of McDaniel and Scott with motivations such as to provide a mechanism for regulating data traffic on a computer system by controlling data congestion (Scott, col.1 lines 45-50).

As to **claim 26** McDaniel and Scott disclose the communications system according to claim 25;

McDaniel further discloses the consumer communicates with the NI via verbs (*upper layer protocols ULP application may be use to perform data transfer, pg. 1 paragraph 8, it is inherent that the ULP application need to send commands to the NIC driver for data to be transfer*).

As to **claim 30** McDaniel and Scott disclose the communications system according to claim 25;

McDaniel further discloses the NIC comprises a remote-direct-memory-access-enabled NIC (*the NIC driver and the NIC may perform a one-shot completion process of a RDMA operation, pg. 2 paragraph 19, claim 16*).

As to **claim 33** McDaniel and Scott disclose the communications system according to claim 25;

McDaniel further discloses consumer comprises a verb consumer (it is inherent that the host's *ULP applications comprise commands for performing data transfer, pg. 1 paragraph 8*).

14. **Claim 27 and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Pub. No.: US 2004/0073622 A1 to McDaniel et al., "McDaniel" in view of Patent No.: US 5,958,017 to Scott et al., "Scott" as applied to claim 25 above and further in view of Patent US 6,990,528 B1 to Neal et al. "Neal".

As to **claim 27** McDaniel and Scott disclose the communications system according to claim 25;

McDaniel and Scott disclose do not expressly disclose the consumer comprises a user space application;

Neal discloses a communication system using user space application in a reliable datagram queue pair process (*col. 11 lines 41-64*);

McDaniel, Scott and Neal are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of McDaniel, Scott and Neal with motivations such as to better scaling when multiple processes need to communicate between multiple nodes (Neal, *col. 2 lines 35-39*).

As to **claim 28** McDaniel and Scott disclose the communications system according to claim 25;

McDaniel and Scott do not expressly disclose the consumer comprises a kernel space application;

Neal discloses a communication system using Kernel space application in a reliable datagram queue pair process (*col. 11 lines 41-64*);

McDaniel, Scott and Neal are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of McDaniel, Scott and Neal with motivations such as to better scaling when multiple processes need to communicate between multiple nodes (Neal, *col. 2 lines 35-39*).

15. **Claim 29** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pub. No.: US 2004/0073622 A1 to McDaniel et al., "McDaniel" in view of Patent No.: US 5,958,017 to Scott et al., "Scott" as applied to claim 25 above and further in view of Patent No.: US 5,889,956 to Hauser *et al.*, "*Hauser*".

As to **claim 29** McDaniel and Scott disclose the communications system according to claim 25;

McDaniel and Scott do not expressly disclose least one of the consumer and the NI comprises an SRQ manager that employs statistical provisioning in managing resources of the SRQ

Hauser discloses provisioning network resources such as bandwidth and buffers based on statistically calculated demands (col. 1 lines 1-25);

McDaniel, Scott and Hauser are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott and Hauser with motivations such as to allow resources to be used and assigned more effectively (*Hauser*, col. 3 lines 5-8).

16. **Claim 31** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pub. No.: US 2004/0073622 A1 to McDaniel et al., "McDaniel" in view of Patent No.: US 5,958,017 to Scott et al., "Scott" as applied to claim 25 above and further in view of Patent No.: US 5,889,956 to Hauser *et al.*, "*Hauser*" and patent No.: US 5,999,518 to Nattkemper et al. "Nattkemper".

As to **claim 31** McDaniel and Scott disclose the communications system according to claim 25;

McDaniel and Scott do not expressly disclose at least one of the consumer and the NI locally manages provisioning of the SRQ using statistical information.

Hauser discloses provisioning network resources such as bandwidth and buffers based on statistically calculated demands (col. 1 lines 1-25);

Nattkemper discloses buffer of a switching device being manage by the device (col. 22 lines 25-34);

McDaniel, Scott, Hauser and Nattkemper are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott and Hauser with motivations such as to allow resources to be used and assigned more effectively (*Hauser, col. 3 lines 5-8*) and establishing and updating address information storage (*Nattkemper, col. 1 line 40-41*).

17. **Claim 32** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pub. No.: US 2004/0073622 A1 to McDaniel et al., "McDaniel" in view of Patent No.: US 5,958,017 to Scott et al., "Scott" as applied to claim 25 and in further view of Patent No.: 5,867,663 to McClure et al., "McClure".

As to **claim 32** McDaniel and Scott disclose the communications system according to claim 25;

McDaniel and Scott disclose do not expressly disclose the first QP comprises a send queue (SQ) and a limit queue (LQ).

McClure discloses allocating buffer space to a queue where the buffer space is implemented by assigning a counter limit which represents the number of cell locations in a buffer pool that may be used by a particular queue at any one time during the connection (*col. 5 lines 28-46*);

McDaniel, Scott, McClure are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of McDaniel, Scott and McClure with motivations such as to improve the system resources of a network (*McClure, col. 2 lines 5-8*).

18. **Claim 35, 36 and 37** are rejected under 35 U.S.C. 103(a) as being unpatentable over Patent No.: US 5,958,017 to Scott et al., "Scott" in view of Patent No.: US 5,889,956 to Hauser *et al.*, "*Hauser*" as applied to claim 34 above and further in view of patent No.: US 5,999,518 to Nattkemper et al. "Nattkemper".

As to **claim 35** Scott and Hauser disclose the communications system according to claim 34;

Scott and Hauser do not expressly disclose managing locally resources of the single RQ;

Nattkemper discloses a switching unit where the buffer management is done locally (*col. 22 line 21-59*)

Scott, Hauser and Nattkemper are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott, Hauser and Nattkemper with motivations such as to establishing and updating address information storage (*Nattkemper, col. 1 line 40-41*).

As to **claim 36** Scott and Hauser disclose the communications system according to claim 34;

Scott and Hauser do not expressly disclose managing dynamically resources of the single RQ.

Nattkemper discloses buffer being dynamically provisioned (*col. 22 lines 25-34*);

Scott, Hauser and Nattkemper are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott, Hauser and Nattkemper with motivations such as to establishing and updating address information storage (*Nattkemper, col. 1 lines 40-41*).

As to **claim 37** Scott and Hauser disclose the communications system according to claim 34;

Scott and Hauser do not expressly disclose managing locally RQ resources available to the first QP;

Nattkemper discloses a switching unit where the buffer management is done locally (*col. 22 line 21-59*);

Scott, Hauser and Nattkemper are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott, Hauser and Nattkemper with motivations such as to establishing and updating address information storage (*Nattkemper, col. 1 lines 40-41*).

19. **Claim 38** is rejected under 35 U.S.C. 103(a) as being unpatentable over Patent No.: US 5,958,017 to Scott et al., "Scott" in view of Patent No.: US 5,889,956 to Hauser et al., "*Hauser*" and patent No.: US 5,999,518 to Nattkemper et al. "Nattkemper" as applied to claim 37 above and further in view of Pub. No.: US 2002/0003777 A1 to Miyamoto, "*Miyamoto*".

As to **claim 38** McDaniel, Hauser and Nattkemper disclose the communications system according to claim 37;

McDaniel, Hauser and Nattkemper do not expressly disclose managing comprises limiting RQ resources available to the first QP;

Miyamoto discloses managing a queue to prevent certain connections from monopolizing the queue (*pg. 5 paragraph 77*)

Scott, Hauser, Nattkemper and Miyamoto are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott, Hauser, Nattkemper and Miyamoto with motivations such as to efficiently control traffic congestion in a communication system (*Miyamoto*, pg. 1 paragraph 13).

20. **Claim 39 and 40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Patent No.: US 5,958,017 to Scott et al., "Scott" in view of Patent No.: US 5,889,956 to Hauser *et al.*, "*Hauser*" as applied to claim 34 above in further view of Patent US 6,990,528 B1 to Neal et al. "Neal".

As to **claim 39** Scott and Hauser disclose the communications system according to claim 34;

Scott and Hauser do not expressly the first QP is used by a user space application;

Neal discloses a communication system where a queue pair is used by a user space application (*col. 11 lines 41-64*);

Scott, Hauser and Neal are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott, Hauser and Neal with motivations such as to better scaling when multiple processes need to communicate between multiple nodes (Neal, col. 2 lines 35-39).

As to **claim 40** Scott and Hauser disclose the communications system according to claim 34;

Scott and Hauser do not expressly the first QP is used by a kernel space application;

Neal discloses a communication system where a queue pair is used by a Kernel space application (*col. 11 lines 41-64*);

Scott, Hauser and Neal are analogous art because they are from the same field of endeavor with respect to communication systems;

At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Scott, Hauser and Neal with motivations such as to better scaling when multiple processes need to communicate between multiple nodes (Neal, col. 2 lines 35-39).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Louis Bell whose telephone number is 571-270-3312. The examiner can normally be reached on Monday-Friday 7:30 a.m. to 5:30 p.m..

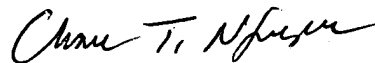
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on 571-272-3126. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/LB/



CHAU NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600